Invasive Group A Streptococcal Disease (IGAS) and Streptococcal Toxic Shock Syndrome (STSS) Surveillance Protocol

Healthcare Provider Responsibilities

1. Report any of the following to your local health department within one week of diagnosis:

- Isolation of GAS (Group A Streptococcus) (*S. pyogenes*) by culture from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid);
- Cases of necrotizing fasciitis associated with GAS infection; and
- Case of toxic shock syndrome (TSS) with GAS infection grown from ANY site

2. Submit paper copies of laboratory reports to the local health department via fax.

3. Complete the provider section of the West Virginia Electronic Disease Surveillance System (WVEDSS) form for Invasive Group A Streptococcal Disease and Streptococcal Toxic Shock Syndrome: **http://www.wvdhhr.org/idep/pdfs/WVEDSS/InvasiveBacterialDiseaseGrpA.pdf**

Laboratory Responsibilities

1. Notify the physician and infection control practitioner of a positive test result for group A streptococcus (S. pyogenes) isolated from normally sterile site or from any site for STSS.

2. Notify and fax a copy of a positive test result of Group A streptococcus (S. pyogenes) isolated from a normally sterile site or from any site for STSS to your local health department within one week of diagnosis for public health investigation. For reference labs, please fax and notify West Virginia Division of Infectious Disease Epidemiology Division (DIDE) at 304-558-5358 (phone) and fax 304-558-8736.

Public Health Responsibilities (Action)

1. Educate your healthcare providers and laboratories to report cases of Invasive Group A *streptococcus* (IGSA) and Streptococcal Toxic Shock Syndrome (STSS) to your health department in the patient's county of residence within 24 hours of diagnosis.

2. When a case is reported:

   a. Verify the diagnosis. Confirm that the IGAS was isolated from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural or pericardial fluid).

   b. Investigate using West Virginia Invasive Bacterial Disease – Group A Streptococcus and Streptococcal Toxic Shock Syndrome Case Report Form at http://www.wvidep.org/Portals/31/PDFs/WVEDSS/invasivebacterialdiseaseGrpA.pdf by collecting information from providers, laboratories, and if necessary by directly contacting the patient.

Disease Prevention Objective

To reduce the incidence of IGAS and STSS through education on proper treatment and preventive actions for all GAS infections.

Disease Control Objectives

Prevent secondary cases by isolation of the case (streptococcal pharyngitis or skin infections) until at least 24 hours after start of appropriate antibiotic therapy.

Disease Surveillance Objectives

1. To identify demographic characteristics and risk factors of infected persons with invasive Group A Streptococcus disease.

2. To identify the types of infections associated with invasive Group A Streptococcus isolates.

3. To identify close contacts of the case and provide recommendations for appropriate preventive measures to prevent infection and complications in the contacts and further spread of disease.

4. To promptly identify clusters or outbreaks of disease in order to initiate appropriate prevention and control measures.

Public Health Significance

Group A streptococcus is a bacterium often found in the throat and on the skin. People may carry group A streptococci in the throat or on the skin and have no symptoms of illness. Most GAS infections are relatively mild illnesses such as "strep throat," or impetigo. On rare occasions, these bacteria can cause other severe and even life-threatening diseases. In the United States approximately 10,000 to 15,000 cases of invasive GAS disease occur each year resulting in over 2,000 deaths. CDC estimates that 500 to 1,500 cases of necrotizing fasciitis and 2,000 to 3,000 cases of streptococcal toxic shock syndrome occur each year in the United States. Approximately 20% of patients with necrotizing fasciitis die, and 60% of patients with streptococcal toxic shock syndrome die. About 10% to 15% of patients with other forms of invasive group A streptococcal disease die. In contrast, several million persons get "strep throat" and impetigo annually.

IGAS occurs year round with peak incidence reported from December through March. People with underlying conditions such as cardiac or pulmonary disease, diabetes mellitus or HIV infection or those who inject drugs or abuse alcohol are considered at higher risk for IGAS infection. In children, varicella infection has been identified as a significant risk factor.

Clinical Description

Invasive group A streptococcal infections may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with cutaneous infection (e.g., cellulitis, erysipelas, or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and nonfocal bacteremia.

Etiologic Agent

Invasive Group A streptococcal Disease is caused by the bacterium, *Streptococcus Pyogenes*. There are over 100 serologically distinct types of *S. pyogenes* within group A.

Reservoir

Humans are the only known reservoir for *S. pyogenes.*

Mode of Transmission

Transmission is by large respiratory droplets or person to person spread through direct contact with patients or carriers, rarely by indirect contact through objects. Nasal carriers are particularly likely to transmit disease.

Incubation Period

Short incubation period, usually 1-3 days, rarely longer.

Infectious Period

- Infectious period in untreated, uncomplicated IGAS disease is 10-21 days.
- In untreated conditions with purulent discharges - weeks or months.
- Persons with untreated streptococcal pharyngitis may carry and transmit the bacteria for weeks or months with sharply decreasing contagiousness 2-3 weeks after onset of illness.
- Treating an infected person with an antibiotic for 24 hours or longer generally eliminates their ability to spread the bacteria.

Outbreak Recognition

If the number of reported cases of invasive GAS infection in your county is higher than usual or if you suspect an outbreak in a school, daycare, hospital, or long-term care facility, please contact your local health department immediately. This situation may warrant an investigation of clustered cases to determine a course of action to prevent further cases.

Case definitions

Streptococcus Disease, Invasive, Group A *(Streptococcus pyogenes)* (1995)

Clinical description

Invasive group A streptococcal infections may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with cutaneous infection (e.g., cellulitis, erysipelas, or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and nonfocal bacteremia.

Laboratory criteria for diagnosis

Isolation of group A *Streptococcus* (*Streptococcus pyogenes*) by culture from a normally sterile site (e.g., blood or cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid)

Case classification

Confirmed: a case that is laboratory confirmed

Streptococcal Toxic-Shock Syndrome (STSS) (2010)

Clinical description

Streptococcal toxic-shock syndrome (STSS) is a severe illness associated with invasive or noninvasive group A streptococcal (*Streptococcus pyogenes*) infection. STSS may occur with infection at any site but most often occurs in association with infection of a cutaneous lesion. Signs of toxicity and a rapidly progressive clinical course are characteristic, and the case fatality rate may exceed 50%.

Clinical case definition

An illness with the following clinical manifestations*:

- Hypotension defined by a systolic blood pressure less than or equal to 90 mm Hg for adults or less than the fifth percentile by age for children aged less than 16 years.
- Multi-organ involvement characterized by two or more of the following:
    - Renal impairment: creatinine greater than or equal to 2 mg/dL (greater than or equal to 177 µmol/L) for adults or greater than or equal to twice the upper limit of normal for age. In patients with preexisting renal disease, a greater than twofold elevation over the baseline level.

      Coagulopathy: Platelets less than or equal to 100,000/mm3 (less than or equal to 100 x 106/L) or disseminated intravascular coagulation, defined by prolonged clotting times, low fibrinogen level, and the presence of fibrin degradation products.
      Liver involvement: Alanine aminotransferase, aspartate aminotransferase, or total bilirubin levels greater than or equal to twice

the upper limit of normal for the patient's age. In patients with preexisting liver disease, a greater than twofold increase over the baseline level.
Acute respiratory distress syndrome: defined by acute onset of diffuse pulmonary infiltrates and hypoxemia in the absence of cardiac failure or by evidence of diffuse capillary leak manifested by acute onset of generalized edema, or pleural or peritoneal effusions with hypoalbuminemia.
A generalized erythematous macular rash that may desquamate.
Soft-tissue necrosis, including necrotizing fasciitis or myositis, or gangrene.

* Clinical manifestations do not need to be detected within the first 48 hours of hospitalization or illness, as specified in the 1996 case definition. The specification of the 48 hour time constraint was for purposes of assessing whether the case was considered nosocomial, not whether it was a case or not.

Laboratory criteria for diagnosis

Isolation of group A *Streptococcus*.

Case classification

Probable: a case that meets the clinical case definition in the absence of another identified etiology for the illness and with isolation of group A *Streptococcus* from a nonsterile site.

Confirmed: a case that meets the clinical case definition and with isolation of group A *Streptococcus* from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Preventive Interventions

The spread of all types of GAS infection can be reduced by good hand washing, especially after coughing and sneezing and before preparing foods or eating.

- Personal hygiene, good nutrition and housing, good sanitation, and proper handling of secretions are important in controlling the spread of GAS.
- Penicillin continues to be the drug of choice. Many strains show resistance to Chloramphenicol, the aminoglycosides, sulfonamides, and tetracycline. While resistance to erythromycin only runs from 1 - 5% in the US, elsewhere in the world it has been reported to be as high as 60%.(5) As a result, antibiotic sensitivity testing is highly recommended.

Foodhandlers:

- Persons diagnosed with streptococcal sore throat or with infected wounds or cuts on their hands should not handle food. They may return to food handling duties when they are afebrile and when approved by either the local health department or the West Virginia Infectious Disease Epidemiology Program.
- Symptomatic contacts of persons with diagnosed GAS infections should be tested to determine the cause of their illness. Persons whose test for GAS is positive should refrain from handling food until they are afebrile and approved to return to work by either the local health department or the West Virginia Infectious Disease Epidemiology Program.

Child Care:

- Strep sore throat can be common in childcare programs. Educating childcare attendants and the children on the importance of handwashing is key to preventing the spread of GAS in the childcare setting.
- All children and staff who have strep sore throat should be excluded from attendance until 24 hours after starting appropriate antibiotic therapy and they are afebrile
- When GAS infection is identified in a childcare attendee or staff member, other symptomatic attendees and staff members should be tested and appropriate antibiotic therapy should be instituted.
- To prevent spread of the infection, efforts should be made to prevent the transfer of children to other childcare centers. Closure of affected childcare centers may lead to placement of infected children in other centers (with subsequent transmission in those centers) and is generally counterproductive.
- When two or more symptomatic cases of GAS are identified in children or employees of a child- care facility, contact the District Communicable Disease Coordinator and the Bureau of Child Care *immediately.*

Surveillance Indicators

- Proportion of cases with complete demographic information
- Proportion of cases with type of infection and specimen source reported
- Proportion of cases with underlying medical conditions reported
- Proportion of cases with Risk Factors (surgery and child birth) information
- Proportion of cases with clinical information within 48 hours of hospitalization
- Median number of days between date of onset of clinical symptoms and date of report to public health authorities.

References

Group A Streptococcal Infections, Red Book – 28th edition – 2009 Report of the Committee on Infectious Diseases, American Academy of Pediatrics.